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EXAMINER	
WU, QING YUAN	

ART UNIT	PAPER NUMBER
2194	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/658,626	SHAH ET AL.	
	Examiner	Art Unit	
	Qing-Yuan Wu	2194	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 January 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-43 and 56* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-43 and 56* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *8/22/05*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-43 and 56 are pending in this application.

Claim Objections

2. Claim 23 is objected to because of the following informalities: "acurrent" should read --a current--. Appropriate correction is required.

Continued Examination Under 37 CFR 1.114

3. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 1/14/08 has been entered.

Claim Rejections - 35 USC § 101

4. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

5. Claims 29-43 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claims 29-43 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter because they are lacking utilities. More specifically, these claims recite the limitation "a storage medium having a plurality of machine accessible instructions." but failed to indicate what permits the instructions to be realized (i.e. the computer executable code or instructions must be stored in a computer readable medium, and executed by a computer element to perform control of a technical procedure). See MPEP 2106.01.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 1-43 and 56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Auslander et al. (hereafter Auslander) (US Publication 2003/0200457) in view of Singhal et al. (hereafter Singhal) (US Patent 6,578,033).

8. As per Claim 1, Auslander teaches the invention substantially as claimed including a method of managing a lock utilized by a plurality of threads executing on a computing device to coordinate access to a shared resource (page 2, paragraph 17) comprising:

selecting by one of the threads an action to be performed by the thread upon the lock (page 2, paragraph 20), wherein the action is selected from a group comprising:

acquiring the lock (pages 2 & 3, paragraph 22);

trying to acquire the lock (pages 2 & 3, paragraph 22); and

releasing the lock (page 2, paragraph 20);

asynchronously querying and receiving a current state of the lock by the thread and representing each state by a multi-part state value, each multi-part state value including a first thread value and a last thread value (page 3, paragraph 22);

speculatively determining by the thread, the next state of the lock, where the next state is the state of the lock if the thread proceeds to perform the selected action and the thread is successful (page 3, paragraph 22); and

attempting to perform by the thread, the selected action to transition the lock from the current state to the speculatively determined next state (page 3, paragraph 22).

9. Auslander does not explicitly teach a flag value. However, Auslander disclosed a head and tail pointers and a combination of the value in the fields of the pointers in determining the state of the lock, (i.e. head and tail fields defined to be null, tail points to head and head remains null, etc.) (pages 2-3, paragraph 22; Fig. 2).

10. It would have been obvious to one of ordinary skill in the art at the time of invention to have recognized that a lock state being represented by a flag value can be inferred by Auslander by recognizing both fields (head and tail) of the lock, one of ordinary skill in the art would have

been motivated to modified the teaching of Auslander to make explicit the implicit lock state to achieve the predictable results determining the lock state.

11. Furthermore, Auslander does not explicitly teach that the lock is considered to be in any one of at least four states in any point in time. However, Auslander disclosed a lock in various lock states (pages 2-3, paragraph 22; Fig. 2). Singhal discloses a method in which a lock can be in any of at least four states at any time (column 5, line 14 & Figure 7).

12. It would have been obvious to one of ordinary skill in the art at the time of invention to have the lock of at least four states of Singhal's invention be the lock in Auslander's invention. One would have been motivated to use this lock since it is known in the computing arts that a lock can have multiple states.

13. As per Claim 2, Auslander as modified teaches the invention substantially as claimed including if the transition fails to acquire or release the lock to repeat the following steps until transition succeeds (page 3, paragraph 22):

querying the current state of the lock (page 3, paragraph 22);

determining the next state of the lock (page 3, paragraph 22); and

transitioning lock from current state to next determined state (page 3, paragraph 22).

14. As per Claim 3, Auslander as modified teaches the invention substantially as claimed including if:

state transition succeeds (page 3, paragraph 22);

selected action is acquiring the lock (page 2, paragraph 21); and

determined next state represents acquisition of the lock (page 3, paragraph 22); then

indicate acquisition of the lock (page 2 & 3, paragraph 22).

15. As per Claim 4, Auslander as modified teaches the invention substantially as claimed including if:

state transition succeeds (page 3, paragraph 22);

selected action is acquiring the lock (page 2, paragraph 21); and

determined next state does not represent acquisition of the lock (page 3, paragraph 22); then

add the thread to the end of a queue of threads waiting to acquire the lock (page 2, paragraph 21);

wait to receive notification that thread may acquire the lock (page 2, paragraph 21); and

indicate the acquisition of the lock (page 2 & 3, paragraph 22).

16. As per Claim 5, Auslander as modified teaches the invention substantially as claimed including if:

state transition succeeds (page 3, paragraph 22); and

selected action is releasing the lock (page 3, paragraph 22); then

determine the number of threads in queue waiting to acquire lock utilizing the determined next stet of the lock (page 2, paragraph 21).

17. As per Claim 6, Auslander further discloses that if the queue includes at least a first thread (page 3, paragraph 22):

remove the first thread from the queue (page 3, paragraph 22); and

notify the first thread that it has acquired the lock (page 3, paragraph 22).

18. As per Claim 7, Auslander as modified teaches the invention substantially as claimed including if:

selected action is trying to acquire the lock (page 2, paragraph 21); and

state transition fails (page 3, paragraph 22); then

indicate the lock was unable to be acquired (page 3, paragraph 22).

19. As per Claim 8, Auslander as modified teaches the invention substantially as claimed including if:

state transition succeeds (page 3, paragraph 22); and

selected action is trying to acquire the lock (page 2, paragraph 21); then

indicate the acquisition of the lock (page 2 & 3, paragraph 22).

20. As per Claims 9-12, they are rejected for the same reason as Claims 3-6 above.

21. As per Claim 13, Auslander as modified teaches the invention substantially as claimed including:

a unique thread identifier (page 2, paragraph 18);

next thread field to facilitate access to the next thread in a queue of thread waiting to acquire the lock (page 2, paragraph 18 & 21); and

thread is capable of waiting for single lock at a time (page 2, paragraph 20).

22. As per Claim 14, Auslander as modified teaches the invention substantially as claimed including that the action of acquiring the lock includes the inability to timeout or fail to acquire the lock (page 2, paragraph 20).

23. As per Claim 15, Auslander as modified teaches the invention substantially as claimed including that when the locks state may change:

querying the current state of the lock (page 3, paragraph 22); and

transitioning the lock from the current state to the next determined state of the lock (page 3, paragraph 22).

24. As per Claim 56, Auslander as modified teaches the invention substantially as claimed including the next state is one of:

the lock is not held and there are no threads waiting to access the shared resource (Singhal, column 7, lines 10-11);

the lock is held and there are no threads waiting to access the shared resource (Singhal, column 7, lines 12-13);

the lock is held and there is one thread waiting to access the shared resource (Singhal, column 7, lines 14-15); and

the lock is held and there are at least two threads waiting to access the shared resource (Singhal, column 10, lines 5-10).

25. As per Claim 16, this claim is rejected for the same reason as claim 1 above. In addition, Auslander as modified teaches the invention substantially as claimed including an apparatus comprising:

a processor (page 1, paragraph 1);

a storage medium coupled to the processor, and having stored therein programming instructions to be operated by the processor to implement a lock acquirer to acquire a lock, having a multi-part value (page 2, paragraph 18).

26. As per Claim 17, Auslander as modified teaches the invention substantially as claimed including that the lock acquirer is capable of performing two general actions of acquiring the lock (page 2 & 3, paragraph 22) and trying to acquire the lock (page 2 &3, paragraph 22) wherein:

state transition fails (page 3, paragraph 22); and

general action is acquiring the lock (page 2 & 3, paragraph 22) then the lock acquirer is capable of repeating (page 3, paragraph 22) the steps of:

querying the current state of the lock (page 3, paragraph 22);

determining the next state of the lock (page 3, paragraph 22); and

attempting to transition the lock from current state to the next determined state of the lock (page 3, paragraph 22).

27. As per Claim 18, Auslander as modified teaches the invention substantially as claimed including indicating that the lock was unable to be acquired (page 3, paragraph 22).

28. As per Claim 19, Auslander as modified teaches the invention substantially as claimed including indicating that the lock was acquired (page 2 & 3, paragraph 22).

29. As per Claim 20, it is rejected for the same reason as Claim 3 above.

30. As per Claim 21, Auslander as modified teaches the invention substantially as claimed including if:

state transition fails (page 3, paragraph 22);

general action is acquire the lock (page 2, paragraph 21); and

determined next state does not represent acquisition of the lock (page 3, paragraph 22); then the lock acquirer is further capable of

adding the thread to the end of a queue of threads waiting to acquire the lock (page 2, paragraph 21);

waiting to receive notification that the thread may acquire the lock (page 2, paragraph 21); and

indicating the acquisition of the lock (page 2 & 3, paragraph 22).

31. As per Claim 22, it is rejected for the same reason as Claim 14 above.

32. As per Claim 23, this claim is rejected for the same reason as claims 1 and 16 above. In addition, Auslander as modified teaches the invention substantially as claimed including an apparatus comprising:

a lock releaser to release a lock, having a multi-part value (page 2, paragraph 18);

wherein the lock releaser releases a hold on the lock (page 2, paragraph 20).

33. As per Claim 24, it is rejected for the same reason as Claim 2 above.

34. As per Claim 25, Auslander as modified teaches the invention substantially as claimed including that if the state transition succeeds (page 3, paragraph 22), the lock releaser is further capable of determining the number of threads in a queue waiting to acquire the lock utilizing the determined next state of the lock (page 2, paragraph 21).

35. As per Claim 26, it is rejected for the same reason as Claim 6 above.

36. As per Claim 27, Auslander as modified teaches the invention substantially as claimed including that the lock releaser (page 2, paragraph 20) is capable of removing the first thread from the queue utilizing a thread having:

a unique thread identifier (page 2, paragraph 18); and

a next thread value to facilitate access to the next thread in the queue (page 2, paragraph 18 & 21).

37. As per Claim 28, it is rejected for the same reason as Claim 15 above.

38. As per Claims 29-43, they are rejected for the same reason as Claims 1-15 above.

Response to Arguments

39. Applicant's arguments filed 1/14/08 have been fully considered but they are not persuasive.

40. In the remarks, Applicant argued in substance that:

a. Auslander and Singhal do not teach or suggest each state being represented by a multi-part state value including a flag value, a first thread value, and a last thread value, and one of ordinary skill in the art would not find motivation in either Auslander or Singhal to modify the references to represent a lock state with multi-part state value.

b. Neither Auslander nor Singhal teach or suggest "speculatively determining by the thread, the next state of the lock, where the next state is the state of the lock if the thread proceeds to perform the selected action and the thread is successful.".

41. Examiner respectfully traversed Applicant's remarks:

42. As to point (a), the argument is moot in view of the new ground of rejection necessitated by applicant's amendment.

43. As to point (b), the examiner respectfully disagrees and submits that "speculation" was merely described as the capability to determined what the state of the lock will be given the current state and action to be performed [PG Publication 2005/0055593, paragraph 24], given the multiple states as being taught by Auslander and Singhal (see mapping of rejection for multiple lock states above), the teaching of Auslander and Singhal clearly teach the speculation of the next state of a lock by determining the current lock state and action to be performed (i.e. a lock with head and tail pointer in null (state 1), upon successful acquiring of the lock by a thread (action), tail is set to head and head is set to null (state 2), etc.) [Fig. 2; pages 2-3, paragraph 22; Singhal, Figs. 5-7].

44. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Qing-Yuan Wu whose telephone number is (571)272-3776. The examiner can normally be reached on 8:30am-6:00pm Monday-Thursday and alternate Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Meng Ai An can be reached on (571) 272-3756. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

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